

Amendments to the Claims

Please cancel claims 1-36 without prejudice.

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-36. (cancelled).

37. (new) A method for preparing a synthetic magnesium silicate having a crystal structure similar to natural hectorite; the method comprising:

forming a precursor slurry;

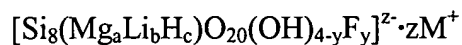
subjecting the precursor slurry to a continuous hydrothermal reaction in a pipe reactor at a temperature ranging from 210 °C to 400 °C and under a pressure of at least 20 bar for 10 seconds to 4 hours to form the synthetic magnesium silicate, wherein the precursor slurry is not washed and filtered before it is subjected to the continuous hydrothermal reaction; and

washing and filtering the synthetic magnesium silicate to remove water soluble salts formed in the preparation of the precursor slurry.

38. (new) The method of claim 37, wherein forming the precursor slurry comprises:

forming an aqueous suspension of magnesium carbonate, and

forming a silica precipitate in the aqueous magnesium carbonate suspension, the proportions of magnesium provided by the magnesium carbonate and of silica precipitated in the suspension corresponding to the formula of:

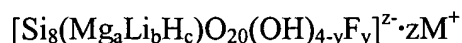


where a ranges from 4.9 to 5.7; b ranges from 0 to 1.05; c ranges from 0 to less than 2; (a + b + c) ranges from 5 to less than 8; y ranges from 0 to less than 4; z = 12-2a-b-c; and M is Na or Li.

39. (new) The method of claim 37, wherein forming the precursor slurry comprises co-precipitating (a) a water-soluble magnesium salt; (b) sodium silicate; and (c) sodium carbonate or sodium hydroxide with a material capable of delivering lithium ions and fluoride ions such that in the formed precursor slurry the following atomic ratios are present: Si/F is 0.5 to 5.1; Li/Mg is 0.1 to 1.0; Si/(Mg + Li) is 0.5 to 1.5; and Na/(2Mg + F-Li) is 1.0 to 2.0.
40. (new) The method of claim 39, wherein the material comprises lithium fluoride.
41. (new) The method of claim 39, wherein the material comprises a lithium compound in conjunction with hydrofluoric acid, fluosilicic acid, or sodium silicofluoride all sodium fluoride.
42. (new) The method of claim 39, wherein co-precipitation is performed with agitation and at a temperature of at least 60 °C.
43. (new) The method of claim 39, wherein the co-precipitation comprises:
- (a) adding the water-soluble magnesium to the lithium and fluoride ions delivering material;
 - (b) adding the sodium carbonate or sodium hydroxide solution to the solution formed in (a); and

(c) adding the sodium silicate to the solution formed in (b).

44. (new) The method of claim 37, wherein the synthetic magnesium silicate has the formula of:



where a ranges from 4.9 to 5.7; b ranges from 0 to 1.05; c ranges from 0 to less than 2; (a + b + c) ranges from 5 to less than 8; y ranges from 0 to less than 4; z = 12-2a-b-c; and M is Na or Li; and

forming the precursor slurry comprises:

precipitating a magnesium silicate having the desired value of "a" in the precursor slurry by combining an aqueous solution of a water soluble magnesium salt with an aqueous alkaline solution of one or more sodium compounds in the presence of dissolved silicon-delivering material.

45. (new) The method of claim 44, wherein pH of the alkaline solution ranges from 8 to 12.5 during precipitation.

46. (new) The method of claim 37, wherein the temperature and the pressure of the continuous hydrothermal reaction is from 240 °C to 380 °C and at least 30 bar, respectively.

47. (new) The method of claim 37, wherein the temperature and pressure of the continuous hydrothermal reaction is from 250 °C to 350 °C and at least 40 bar, respectively.

48. (new) The method of claim 37, wherein forming the precursor slurry is performed continuously.

49. (new) The method of claim 37, wherein both the formation of the precursor slurry and the hydrothermal reaction take place simultaneously as a continuous process in the pipe reactor.

50. (new) The method of claim 37, further comprising drying the washed and filtered synthetic magnesium silicate crystals at a temperature of up to 450 °C at normal atmospheric pressure.

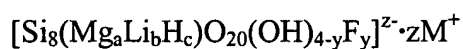
51. (new) A synthetic magnesium silicate prepared by a method comprising:

preparing a precursor slurry comprising a magnesium compound and silica;

subjecting the precursor slurry to a continuous hydrothermal reaction in a pipe reactor at a temperature ranging from 210 °C to 400 °C and at a pressure of at least 20 bar for 10 seconds to 4 hours to form the synthetic magnesium silicate, wherein the precursor slurry is not washed and filtered before it is subjected to the continuous hydrothermal reaction; and

washing and filtering the synthetic magnesium silicate to remove water soluble salts formed in the preparation of the precursor slurry.

52. (new) The synthetic magnesium silicate of claim 51, wherein the proportions of magnesium, provided by the magnesium compound, and of silica correspond to that of the formula:



where a ranges from 4.9 to 5.7; b ranges from 0 to 1.05; c ranges from 0 to less than 2; (a + b + c) ranges from 5 to less than 8; y ranges from 0 to less than 4; z = 12-2a-b-c; and M is Na or Li.

53. (new) The synthetic magnesium silicate of claim 51, wherein the magnesium compound comprises magnesium carbonate.

54. (new) The synthetic magnesium silicate of claim 51, wherein forming the precursor slurry comprises forming a silica precipitate by adding the silica to an aqueous suspension of magnesium carbonate.

55. (new) The synthetic magnesium silicate of claim 51, wherein forming the precursor slurry is performed continuously.

56. (new) A synthetic magnesium silicate of a general formula:

$[\text{Si}_8(\text{Mg}_a\text{Li}_b\text{H}_c)\text{O}_{20}(\text{OH})_{4-y}\text{F}_y]^{z-} \cdot z\text{M}^+$ where a ranges from 4.9 to 5.7; b ranges from 0 to 1.05; c ranges from 0 to less than 2; (a + b + c) ranges from 5 to less than 8; y ranges from 0 to less than 4; z = 12-2a-b-c; and M is Na or Li, prepared by a method, comprising:

precipitating a magnesium silicate having the desired value of "a" in a slurry by combining an aqueous solution of a water soluble magnesium salt with an aqueous alkaline solution of one or more sodium compounds in the presence of dissolved silicon-delivering material, the pH of the alkaline solution being maintained at 8 to 12.5 throughout to form an aqueous slurry;

hydrothermally treating the aqueous slurry in a pipe reactor at a temperature ranging from 210 °C to 400 °C and under a pressure of at least 20 bar for 10 seconds to 4 hours to form synthetic magnesium silicate crystals, wherein the aqueous slurry is not washed and filtered before it is hydrothermally treated; and

washing and filtering the washing and filtering the synthetic magnesium silicate to remove water soluble salts formed in the preparation of the aqueous slurry.